Encyclopædia of Religion and Ethics

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LISTS OF ABBREVIATIONS

I. General

A.H. = Anno Hijrae (A.D. 622).
Ak. = Akkadian.
Alex. = Alexandrian.
Amer. = American.
Apoc. = Apocalypse, Apocalyptic.
Apocr. = Apocrypha.
Aq. = Aquila.
Arab. = Arabic.
Aram. = Aramaic.
Arm. = Armenian.
Ary. = Aryan.
As. = Asiatic.
Assyr. = Assyrian.
AT = Altes Testament.
AV = Authorized Version.
AVm = Authorized Version margin.
A.Y. = Anno Yazdagird (A.D. 639).
Bab. = Babylonian.
c. = *circa*, about.
Can. = Canaanite.
cf. = compare.
ct. = contrast.
D = Deuteronomist.
E = Elohist.
edd. = editions or editors.
Egyp. = Egyptian.
Eng. = English.
Eth. = Ethiopic.
EV, EVV = English Version, Versions.
f. = and following verse or page.
ff. = and following verses or pages.
Fr. = French.
Germ. = German.
Gr. = Greek.
H = Law of Holiness.
Heb. = Hebrew.
Hel. = Hellenistic.
Hex. = Hexateuch.
Himy. = Himyaritic.
Ir. = Irish.
Iran. = Iranian.
Isr. = Israelite.
J = Jahwist.
J" = Jehovah.
Jerus. = Jerusalem.
Jos. = Josephus.
LXX = Septuagint.
Min. = Minæan.
MSS = Manuscripts.
MT = Massoretic Text.
n. = note.
NT = New Testament.
Onḳ. = Onḳelos.
OT = Old Testament.
P = Priestly Narrative.
Pal. = Palestine, Palestinian.
Pent. = Pentateuch.
Pers. = Persian.
Phil. = Philistine.
Phœn. = Phœnician.
Pr. Bk. = Prayer Book.
R = Redactor.
Rom. = Roman.
RV = Revised Version.
RVm = Revised Version margin.
Sab. = Sabæan.
Sam. = Samaritan.
Sem. = Semitic.
Sept. = Septuagint.
Sin. = Sinaitic.
Skr. = Sanskrit.
Symm. = Symmachus.
Syr. = Syriac.
t. (following a number) = times.
Talm. = Talmud.
Targ. = Targum.
Theod. = Theodotion.
TR = Textus Receptus, Received Text.
tr. = translated or translation.
VSS = Versions.
Vulg., Vg. = Vulgate.
WH = Westcott and Hort's text.

II. Books of the Bible

Old Testament.

Gn = Genesis.
Ex = Exodus.
Lv = Leviticus.
Nu = Numbers.
Dt = Deuteronomy.
Jos = Joshua.
Jg = Judges.
Ru = Ruth.
1 S, 2 S = 1 and 2 Samuel.
1 K, 2 K = 1 and 2 Kings.
1 Ch, 2 Ch = 1 and 2 Chronicles.
Ezr = Ezra.
Neh = Nehemiah.
Est = Esther.
Job.
Ps = Psalms.
Pr = Proverbs.
Ec = Ecclesiastes.
Ca = Canticles.
Is = Isaiah.
Jer = Jeremiah.
La = Lamentations.
Ezk = Ezekiel.
Dn = Daniel.
Hos = Hosea.
Jl = Joel.
Am = Amos.
Ob = Obadiah.
Jon = Jonah.
Mic = Micah.
Nah = Nahum.
Hab = Habakkuk.
Zeph = Zephaniah.
Hag = Haggai.
Zec = Zechariah.
Mal = Malachi.

Apocrypha.

1 Es, 2 Es = 1 and 2 Esdras.
To = Tobit.
Jth = Judith.
Ad. Est = Additions to Esther.
Wis = Wisdom.
Sir = Sirach or Ecclesiasticus.
Bar = Baruch.
Three = Song of the Three Children.
Sus = Susanna.
Bel = Bel and the Dragon.
Pr. Man = Prayer of Manasses.
1 Mac, 2 Mac = 1 and 2 Maccabees.

New Testament.

Mt = Matthew.
Mk = Mark.
Lk = Luke.
Jn = John.
Ac = Acts.
Ro = Romans.
1 Co, 2 Co = 1 and 2 Corinthians.
Gal = Galatians.
Eph = Ephesians.
Ph = Philippians.
Col = Colossians.
1 Th, 2 Th = 1 and 2 Thessalonians.
1 Ti, 2 Ti = 1 and 2 Timothy.
Tit = Titus.
Philem = Philemon.
He = Hebrews.
Ja = James.
1 P, 2 P = 1 and 2 Peter.
1 Jn, 2 Jn, 3 Jn = 1, 2, and 3 John.
Jude.
Rev = Revelation.

III. For the Literature

1. The following authors' names, when unaccompanied by the title of a book, stand for the works in the list below.

Baethgen = *Beiträge zur sem. Religionsgesch.*, 1888.
Baldwin = *Dict. of Philosophy and Psychology*, 3 vols. 1901–05.
Barth = *Nominalbildung in den sem. Sprachen*, 2 vols. 1889, 1891 ([2]1894).
Benzinger = *Heb. Archäologie*, 1894.
Brockelmann = *Gesch. d. arab. Litteratur*, 2 vols. 1897–1902.
Bruns-Sachau = *Syr.-Röm. Rechtsbuch aus dem fünften Jahrhundert*, 1880.
Budge = *Gods of the Egyptians*, 2 vols. 1903.
Daremberg-Saglio = *Dict. des ant. grec. et rom.*, 1886–90.
De la Saussaye = *Lehrbuch der Religionsgesch.*[3], 1905.
Denzinger = *Enchiridion Symbolorum*[11], Freiburg im Br., 1911.
Deussen = *Die Philos. d. Upanishads*, 1899 [Eng. tr., 1906].
Doughty = *Arabia Deserta*, 2 vols. 1888.
Grimm = *Deutsche Mythologie*[4], 3 vols. 1875–78, Eng. tr. *Teutonic Mythology*, 4 vols. 1882–88.
Hamburger = *Realencyclopädie für Bibel u. Talmud*, i. 1870 ([2]1892), ii. 1883, suppl. 1886, 1891 f., 1897.
Holder = *Altceltischer Sprachschatz*, 1891 ff.
Holtzmann-Zöpffel = *Lexicon f. Theol. u. Kirchenwesen*[2], 1895.
Howitt = *Native Tribes of S.E. Australia*, 1904.
Jubainville = *Cours de Litt. celtique*, i.–xii., 1883 ff.
Lagrange = *Études sur les religions sémitiques*[2], 1904.
Lane = *An Arabic-English Lexicon*, 1863 ff.
Lang = *Myth, Ritual, and Religion*[2], 2 vols. 1899.
Lepsius = *Denkmäler aus Aegypten u. Aethiopien*, 1849–60.
Lichtenberger = *Encyc. des sciences religieuses*, 1876.
Lidzbarski = *Handbuch der nordsem. Epigraphik*, 1898.
McCurdy = *History, Prophecy, and the Monuments*, 2 vols. 1894–96.
Muir = *Orig. Sanskrit Texts*, 1858–72.
Muss-Arnolt = *A Concise Dict. of the Assyrian Language*, 1894 ff.
Nowack = *Lehrbuch d. heb. Archäologie*, 2 vols. 1894.
Pauly-Wissowa = *Realencyc. der classischen Altertumswissenschaft*, 1894 ff.
Perrot-Chipiez = *Hist. de l'art dans l'antiquité*, 1881 ff.
Preller = *Römische Mythologie*, 1858.
Réville = *Religion des peuples non-civilisés*, 1883.
Riehm = *Handwörterbuch d. bibl. Altertums*[2], 1893–94.
Robinson = *Biblical Researches in Palestine*[2], 1856.
Roscher = *Lex. d. gr. u. röm. Mythologie*, 1884 ff.
Schaff-Herzog = *The New Schaff-Herzog Encyclopedia of Religious Knowledge*, 1908 ff.
Schenkel = *Bibel-Lexicon*, 5 vols. 1869–75.
Schürer = *GJV*[3], 3 vols. 1898–1901 [*HJP*, 5 vols. 1890 ff.].
Schwally = *Leben nach dem Tode*, 1892.
Siegfried-Stade = *Heb. Wörterbuch zum AT*, 1893.
Smend = *Lehrbuch der alttest. Religionsgesch.*[2], 1899.
Smith (G. A.) = *Historical Geography of the Holy Land*[4], 1897.
Smith (W. R.) = *Religion of the Semites*[2], 1894.
Spencer (H.) = *Principles of Sociology*[3], 1885–96.
Spencer-Gillen[a] = *Native Tribes of Central Australia*, 1899.
Spencer-Gillen[b] = *Northern Tribes of Central Australia*, 1904.
Swete = *The OT in Greek*, 3 vols. 1893 ff.
Tylor (E. B.) = *Primitive Culture*[3], 1891 [[4]1903].
Ueberweg = *Hist. of Philosophy*, Eng. tr., 2 vols. 1872–74.
Weber = *Jüdische Theologie auf Grund des Talmud u. verwandten Schriften*[2], 1897.
Wiedemann = *Die Religion der alten Aegypter*, 1890 [Eng. tr., revised, *Religion of the Anc. Egyptians*, 1897].
Wilkinson = *Manners and Customs of the Ancient Egyptians*, 3 vols. 1878.
Zunz = *Die gottesdienstlichen Vorträge der Juden*[2], 1892.

2. Periodicals, Dictionaries, Encyclopædias, and other standard works frequently cited.

AA = Archiv für Anthropologie.
AAOJ = American Antiquarian and Oriental Journal.
ABAW = Abhandlungen d. Berliner Akad. d. Wissenschaften.
AE = Archiv für Ethnographie.
AEG = Assyr. and Eng. Glossary (Johns Hopkins University).
AGG = Abhandlungen der Göttinger Gesellschaft der Wissenschaften.
AGPh = Archiv für Geschichte der Philosophie.
AHR = American Historical Review.
AHT = Ancient Hebrew Tradition (Hommel).
AJPh = American Journal of Philology.
AJPs = American Journal of Psychology.
AJRPE = American Journal of Religious Psychology and Education.
AJSL = American Journal of Semitic Languages and Literature.
AJTh = American Journal of Theology.
AMG = Annales du Musée Guimet.
APES = American Palestine Exploration Society.
APF = Archiv für Papyrusforschung.
AR = Anthropological Review.
ARW = Archiv für Religionswissenschaft.
AS = Acta Sanctorum (Bollandus).
ASG = Abhandlungen der Sächsischen Gesellschaft der Wissenschaften.
ASoc = L'Anuée Sociologique.
ASWI = Archæological Survey of W. India.
AZ = Allgemeine Zeitung.
BAG = Beiträge zur alten Geschichte.
BASS = Beiträge zur Assyriologie u. sem. Sprachwissenschaft (edd. Delitzsch and Haupt).
BCH = Bulletin de Correspondance Hellénique.
BE = Bureau of Ethnology.
BG = Bombay Gazetteer.
BJ = Bellum Judaicum (Josephus).
BL = Bamptou Lectures.
BLE = Bulletin de Littérature Ecclésiastique.
BOR = Bab. and Oriental Record.
BS = Bibliotheca Sacra.
BSA = Annual of the British School at Athens.
BSAA = Bulletin de la Soc. archéologique à Alexandrie.
BSAL = Bulletin de la Soc. d'Anthropologie de Lyon.
BSAP = Bulletin de la Soc. d'Anthropologie, etc., Paris.
BSG = Bulletin de la Soc. de Géographie.
BTS = Buddhist Text Society.
BW = Biblical World.
BZ = Biblische Zeitschrift.

CAIBL = Comptes rendus de l'Académie des Inscriptions et Belles-Lettres.
CBTS = Calcutta Buddhist Text Society.
CE = Catholic Encyclopædia.
CF = Childhood of Fiction (MacCulloch).
CGS = Cults of the Greek States (Farnell).
CI = Census of India.
CIA = Corpus Inscrip. Atticarum.
CIE = Corpus Inscrip. Etruscarum.
CIG = Corpus Inscrip. Græcarum.
CIL = Corpus Inscrip. Latinarum.
CIS = Corpus Inscrip. Semiticarum.
COT = Cuneiform Inscriptions and the OT [Eng. tr. of *KAT*²; see below].
CR = Contemporary Review.
CeR = Celtic Review.
ClR = Classical Review.
CQR = Church Quarterly Review.
CSEL = Corpus Script. Eccles. Latinorum.
DAC = Dict. of the Apostolic Church.
DACL = Dict. d'Archéologie chrétienne et de Liturgie (Cabrol).
DB = Dict. of the Bible.
DCA = Dict. of Christian Antiquities (Smith-Cheetham).
DCB = Dict. of Christian Biography (Smith-Wace).
DCG = Dict. of Christ and the Gospels.
DI = Dict. of Islam (Hughes).
DNB = Dict. of National Biography.
DPhP = Dict. of Philosophy and Psychology.
DWAW = Denkschriften der Wiener Akad. der Wissenschaften.
EBi = Encyclopædia Biblica.
EBr = Encyclopædia Britannica.
EEFM = Egyp. Explor. Fund Memoirs.
EI = Encyclopaedia of Islām.
ERE = The present work.
Exp = Expositor.
ExpT = Expository Times.
FHG = Fragmenta Historicorum Græcorum (coll. C. Müller, Paris, 1885).
FL = Folklore.
FLJ = Folklore Journal.
FLR = Folklore Record.
GA = Gazette Archéologique.
GB = Golden Bough (Frazer).
GGA = Göttingische Gelehrte Anzeigen.
GGN = Göttingische Gelehrte Nachrichten (Nachrichten der königl. Gesellschaft der Wissenschaften zu Göttingen).
GIAP = Grundriss d. Indo-Arischen Philologie.
GIrP = Grundriss d. Iranischen Philologie.
GJV = Geschichte des jüdischen Volkes.
GVI = Geschichte des Volkes Israel.
HAI = Handbook of American Indians.
HDB = Hastings' Dict. of the Bible.
HE = Historia Ecclesiastica.
HGHL = Historical Geography of the Holy Land (G. A. Smith).
HI = History of Israel.
HJ = Hibbert Journal.
HJP = History of the Jewish People.
HL = Hibbert Lectures.
HN = Historia Naturalis (Pliny).
HWB = Handwörterbuch.
IA = Indian Antiquary.
ICC = International Critical Commentary.
ICO = International Congress of Orientalists.
ICR = Indian Census Report.
IG = Inscrip. Græcæ (publ. under auspices of Berlin Academy, 1873 ff.).
IGA = Inscrip. Græcæ Antiquissimæ.
IGI = Imperial Gazetteer of India² (1885); new edition (1908–09).
IJE = International Journal of Ethics.
ITL = International Theological Library.
JA = Journal Asiatique.
JAFL = Journal of American Folklore.
JAI = Journal of the Anthropological Institute.
JAOS = Journal of the American Oriental Society.
JASB = Journal of the Anthropological Society of Bombay.
JASBe = Journ. of As. Soc. of Bengal.
JBL = Journal of Biblical Literature.
JBTS = Journal of the Buddhist Text Society.
JD = Journal des Débats.
JDTh = Jahrbücher f. deutsche Theologie.
JE = Jewish Encyclopedia.
JGOS = Journal of the German Oriental Society.
JHC = Johns Hopkins University Circulars.
JHS = Journal of Hellenic Studies.
JLZ = Jenäer Litteraturzeitung.
JPh = Journal of Philology.
JPTh = Jahrbücher für protestantische Theologie.
JPTS = Journal of the Pāli Text Society.
JQR = Jewish Quarterly Review.
JRAI = Journal of the Royal Anthropological Institute.
JRAS = Journal of the Royal Asiatic Society.
JRASBo = Journal of the Royal Asiatic Society, Bombay branch.
JRASC = Journal of the Royal Asiatic Society, Ceylon branch.
JRASK = Journal of the Royal Asiatic Society, Korean branch.
JRGS = Journal of the Royal Geographical Society.
JRS = Journal of Roman Studies.
JThSt = Journal of Theological Studies.
*KAT*² = Die Keilinschriften und das AT² (Schrader), 1883.
*KAT*³ = Zimmern-Winckler's ed. of the preceding (really a totally distinct work), 1903.
KB or *KIB* = Keilinschriftliche Bibliothek (Schrader), 1889 ff.
KGF = Keilinschriften und die Geschichtsforschung, 1878.
LCBl = Literarisches Centralblatt.
LOPh = Literaturblatt für Oriental. Philologie.
LOT = Introduction to Literature of OT (Driver).
LP = Legend of Perseus (Hartland).
LSSt = Leipziger sem. Studien.
M = Mélusine.
MAIBL = Mémoires de l'Acad. des Inscriptions et Belles-Lettres.
MBAW = Monatsbericht d. Berliner Akad. d. Wissenschaften.
MGH = Monumenta Germaniæ Historica (Pertz).
MGJV = Mittheilungen der Gesellschaft für jüdische Volkskunde.
MGWJ = Monatsschrift für Geschichte und Wissenschaft des Judentums.
MI = Origin and Development of the Moral Ideas (Westermarck).
MNDPV = Mittheilungen u. Nachrichten des deutschen Palästina-Vereins.
MR = Methodist Review.
MVG = Mittheilungen der vorderasiatischen Gesellschaft.
MWJ = Magazin für die Wissenschaft des Judentums.
NBAC = Nuovo Bullettino di Archeologia Cristiana.
NC = Nineteenth Century.
NHWB = Neuhebräisches Wörterbuch.
NINQ = North Indian Notes and Queries.
NKZ = Neue kirchliche Zeitschrift.
NQ = Notes and Queries.
NR = Native Races of the Pacific States (Bancroft).
NTZG = Neutestamentliche Zeitgeschichte.
OED = Oxford English Dictionary.
OLZ = Orientalische Litteraturzeitung.
OS = Onomastica Sacra.
OTJC = Old Testament in the Jewish Church (W. R. Smith).
OTP = Oriental Translation Fund Publications.
PAOS = Proceedings of American Oriental Society.

PASB = Proceedings of the Anthropological Soc. of Bombay.
PB = Polychrome Bible (English).
PBE = Publications of the Bureau of Ethnology.
PC = Primitive Culture (Tylor).
PEFM = Palestine Exploration Fund Quarterly Memoirs.
PEFSt = Palestine Exploration Fund Statement.
PG = Patrologia Græca (Migne).
PJB = Preussische Jahrbücher.
PL = Patrologia Latina (Migne).
PNQ = Punjab Notes and Queries.
PR = Popular Religion and Folklore of N. India (Crooke).
PRE^3 = Prot. Realencyclopädie (Herzog-Hauck).
PRR = Presbyterian and Reformed Review.
PRS = Proceedings of the Royal Society.
PRSE = Proceedings Royal Soc. of Edinburgh.
PSBA = Proceedings of the Society of Biblical Archæology.
PTS = Pāli Text Society.
RA = Revue Archéologique.
RAnth = Revue d'Anthropologie.
RAS = Royal Asiatic Society.
RAssyr = Revue d'Assyriologie.
RB = Revue Biblique.
RBEW = Reports of the Bureau of Ethnology (Washington).
RC = Revue Critique.
RCel = Revue Celtique.
RCh = Revue Chrétienne.
RDM = Revue des Deux Mondes.
RE = Realencyclopädie.
REG = Revue des Études Grecques.
REg = Revue Égyptologique.
REJ = Revue des Études Juives.
REth = Revue d'Ethnographie.
RGG = Die Religion in Geschichte und Gegenwart.
RHLR = Revue d'Histoire et de Littérature religieuses.
RHR = Revue de l'Histoire des Religions.
RMM = Revue du monde musulman.
RN = Revue Numismatique.
RP = Records of the Past.
RPh = Revue Philosophique.
RQ = Römische Quartalschrift.
RS = Revue sémitique d'Épigraphie et d'Hist. ancienne.
RSA = Recueil de la Soc. archéologique.
RSI = Reports of the Smithsonian Institution.
RTAP = Recueil de Travaux rélatifs à l'Archéologie et à la Philologie.
RTP = Revue des traditions populaires.
RThPh = Revue de Théologie et de Philosophie.
RTr = Recueil de Travaux.
RVV = Religionsgeschichtliche Versuche und Vorarbeitungen.
RWB = Realwörterbuch.
SBAW = Sitzungsberichte d. Berliner Akademie d. Wissenschaften.
SBB = Sacred Books of the Buddhists.
SBE = Sacred Books of the East.
SBOT = Sacred Books of the OT (Hebrew).
SDB = Single-vol. Dict. of the Bible (Hastings).
SK = Studien und Kritiken.
SMA = Sitzungsberichte d. Münchener Akademie.
SSGW = Sitzungsberichte d. Kgl. Sächs. Gesellsch. d. Wissenschaften.
SWAW = Sitzungsberichte d. Wiener Akademie d. Wissenschaften.
TAPA = Transactions of American Philological Association.
TASJ = Transactions of the Asiatic Soc. of Japan.
TC = Tribes and Castes.
TES = Transactions of Ethnological Society.
ThLZ = Theologische Litteraturzeitung.
ThT = Theol. Tijdschrift.
TRHS = Transactions of Royal Historical Society.
TRSE = Transactions of Royal Soc. of Edinburgh.
TS = Texts and Studies.
TSBA = Transactions of the Soc. of Biblical Archæology.
TU = Texte und Untersuchungen.
WAI = Western Asiatic Inscriptions.
WZKM = Wiener Zeitschrift f. Kunde des Morgenlandes.
ZA = Zeitschrift für Assyriologie.
ZÄ = Zeitschrift für ägyp. Sprache u. Altertumswissenschaft.
ZATW = Zeitschrift für die alttest. Wissenschaft.
ZCK = Zeitschrift für christliche Kunst.
ZCP = Zeitschrift für celtische Philologie.
ZDA = Zeitschrift für deutsches Altertum.
ZDMG = Zeitschrift der deutschen morgenländischen Gesellschaft.
ZDPV = Zeitschrift des deutschen Palästina-Vereins.
ZE = Zeitschrift für Ethnologie.
ZKF = Zeitschrift für Keilschriftforschung.
ZKG = Zeitschrift für Kirchengeschichte.
ZKT = Zeitschrift für kathol. Theologie.
ZKWL = Zeitschrift für kirchl. Wissenschaft und kirchl. Leben.
ZM = Zeitschrift für die Mythologie.
ZNTW = Zeitschrift für die neutest. Wissenschaft.
ZPhP = Zeitschrift für Philosophie und Pädagogik.
ZTK = Zeitschrift für Theologie und Kirche.
ZVK = Zeitschrift für Volkskunde.
ZVRW = Zeitschrift für vergleichende Rechtswissenschaft.
ZWT = Zeitschrift für wissenschaftliche Theologie.

[A small superior number designates the particular edition of the work referred to, as *KAT*^{2}, *LOT*^{6}, etc.]

LAKE-DWELLINGS. — The term 'lake-dwellings' (Fr. *habitations lacustres*; Germ. *Pfahlbauten*; Ital. *palafitte*) is a generic expression to designate those singular habitations which certain peoples were formerly in the habit of constructing, chiefly on fresh-water lakes, and the remains of which are at the present time not infrequently disinterred from ancient lacustrine deposits, either along the shallow margins of existing lakes or on the sites of some of the smaller lake-basins which, in the course of time, have been obliterated by the growth of peat. It is only in comparatively recent times that even the existence of such structures has come to the knowledge of archæologists, but practical researches have already abundantly shown that they were at one time common in many parts of the world, especially in Central Europe and in the British Isles. Herodotus (4th cent. B.C.) describes (v. 16) a lake-dwelling community in Lake Prasias, in Thrace, who lived in huts placed on a wooden platform, supported on tall piles, and connected with the shore by a wooden gangway. Each habitation had a trap-door which gave access to the water beneath; and the lake so abounded with fish that a man had only to open his trap-door and let down a basket by a rope into the water, and, on drawing it up in a short time, he would find it full of fish. But this, and a few other historical notices suggestive of the custom of constructing lake-habitations, failed to disclose the archæological treasures which have lain buried for so many centuries in the ancient lacustrine deposits of nearly all the lake-basins of Central Europe. Now the antiquarian materials collected on lake-dwelling sites are so vast and varied that they hold a prominent position in the principal archæological museums of Europe. To have rescued the evidence of so remarkable a phase of human civilization from oblivion is justly regarded as one of the greatest triumphs of pre-historic archæology. In 1890 the present writer described the *terremare* of the Po valley, the *terpen* of Holland and other analogous structures in Hungary and elsewhere, as mere variants of the lacustrine system of habitation, and, as some remarkable discoveries have since been made in these somewhat obscure fields of research, it is desirable to include a brief notice of them in this article as separate sections.

1. **Lacustrine researches.**—Although the discovery of the remains of pile-structures in Lake Zürich during the winter of 1853–54 is generally regarded as the starting-point of lacustrine archæology, we are not without valid evidence to show that analogous structures, though not so ancient, were known in Ireland fifteen years earlier. It seems that in 1839 curiosity was roused at the Museum of the Royal Irish Academy by the frequency of the visits of a local dealer offering for sale objects of a miscellaneous character, many of which were of rare antiquarian value. These objects were said to have been found in a peat-bog in County Meath, and their assortment in such a place seemed so strange to the Museum authorities that G. Petrie and W. R. Wilde determined to visit the locality. On this expedition they were conducted to the peat-bog of Lagore, near the village of Dunshaughlin, where, within the boundaries of a drained lake and under a thick covering of peat, was an artificial mound then partially exposed by peat-cutters. It seems that this mound had been well known to bone collectors for upwards of ten years; during that time they had dug out and exported to a factory of bone-manure in Scotland no fewer than 150 cart-loads of bones.

The mound was 520 feet in circumference and along its margin were 'upright posts of black oak, measuring from 6 to 8 feet in height; these were mortised into beams of a similar material laid flat upon the marl and sand beneath the bog, and nearly 16 feet below the present surface. The upright posts were held together by connecting crossbeams, and (said to be) fastened by large iron nails.'

An abstract of a paper by Wilde on the Lagore 'find,' from which the above extract is taken, was published in the *Proceedings of the Royal Irish Academy* for 1840, and its contents were so suggestive to local antiquaries that almost immediately several other sites were recognized as island-forts, or *crannogs* (the name given to such structures in the Irish annals). Moreover, during the workings of the Commission of the Arterial Drainage and Inland Navigation of Ireland, no fewer than 22 *crannogs* were brought to light throughout the counties of Roscommon, Leitrim, Cavan, and Monaghan. Reports of these discoveries by the engineers of the Board of Works, with plans, maps, sections, and a large assortment of relics, were deposited at the time in the Museum of the Royal Irish Academy.

The fortuitous circumstances which led to the discovery of the pile-structures (*Pfahlbauten*) of Switzerland are so well known that it is hardly necessary to dwell on them here. It appears that, owing to the lowness of the water in Lake Zürich during the winter of 1853–54, two of the inhabitants of Ober-Meilen, whose vineyards in ordinary times came close to the water in the lake, began to extend their limits by enclosing portions of the exposed shore with a stone wall and filling in the space with the adjacent mud. In course of these operations they came upon the decayed stumps of wooden piles, stone axes, flint implements, and various worked objects of horn and bone, which excited some curiosity among the workmen. J. Staub (*Die Pfahlbauten in den Schweizer-Seen*, Fluntern, 1864, p. 8) informs us that the village schoolmaster, Herr Aeppli, having seen some of the objects with his pupils, went to inspect the locality, and was so impressed with the importance of the find that he sent a brief statement of the facts to the Antiquarian Society at Zürich. Within four hours of the dispatch of his epistle three representatives of the Society arrived at Ober-Meilen, among them being the president, Ferdinand Keller. After careful consideration of the facts, Keller came to the conclusion that originally the piles had supported a platform upon which huts had been erected; that these huts had been inhabited by an industrious population, who were the owners of the stone axes and the other primitive relics disinterred from the mud; and that the lacustrine village had come to an untimely end by a conflagration which destroyed the entire structures down to the water edge.

News of the discoveries at Ober-Meilen spread rapidly among the Swiss people, with the result that an army of explorers immediately began to search for similar remains in other lakes. Guided partly by traditional stories of submerged cities long current among the fishing community, and partly by the knowledge of local fishermen, who, from practical experience of disasters to their nets, could at once point to numberless fields of submerged woodwork, the efforts of these pioneer *lacustreurs* were speedily crowned with success. Keller's first report on the Swiss lake-dwellings, which appeared towards the close of 1854 under the title of 'Die keltischen Pfahlbauten in den Schweizerseen,' at once brought this singular mode of human habitation prominently before the scientific world.

To dredge the bed of a lake with hand-worked appliances in a small boat was a slow process, always expensive, and often unproductive. Yet such was the enthusiasm with which that kind of work was carried on year after year by the Swiss antiquaries that there is scarcely a Cantonal

Museum in the country but contains a valuable collection of lacustrine relics secured in this way. In the course of time, these prosaic methods were powerfully supplemented by the prosecution of various kinds of public works, such as drainage operations, the deepening of harbours, the construction of railways, jetties, etc. Of exceptional importance among such incidental works was the completion of the gigantic operation known as the 'Correction des Eaux du Jura,' which embraced the deepening of the entire waterway of the Jura valley, from the junction of the Lower Thièle with the Aar to the outlet of the Broye at Lake Morat, the result of which was to lower the surface of the lakes of Bienne, Neuchâtel, and Morat from 6 to 8 feet. The permanent effect of these works on the Jura lakes, especially Lake Neuchâtel, was very marked—harbours, jetties, and extensive tracts of shoreland being left high and dry by the subsiding waters. This was the harvest time of archæology. Many of the sites of lacustrine villages became dry land and were visited by crowds of eager relic-hunters; even fishermen forsook their normal avocation, finding it more profitable to fish for pre-historic antiquities.

Another illustration of how public works were utilized for the advancement of archæology was the construction of the splendid bridge which now spans the Limmat at its outlet from Lake Zürich, and the laying out of the adjacent promenades, gardens, and ornamental quays, which occupy what was formerly part of the lake. The filling up of this large area necessitated the use of dredgers, by means of which gravel and mud were raised from the most convenient shallows along the shore and transported as required. Among the localities selected for these operations were the 'Grosser Hafner' and the outskirts of the Bauschanze. The rich loamy deposits of the 'Haumessergrund' at Wollishofen were found to be a suitable soil for the floral gardens. All these localities turned out to be the sites of lake-villages, and yielded an enormous amount of industrial remains of all ages. Indeed, the collection of Bronze Age relics from Wollishofen now deposited in the Antiquarian Museum at Zürich is one of the most valuable hitherto brought to light through lake-dwelling researches.

It is not necessary to notice the successive investigations which have been made throughout Europe in consequence of the publicity given to these discoveries in Switzerland. Suffice it to say that systematic explorations on an extensive scale have conclusively shown that lake-villages, generally in the form of pile-structures, had been prevalent during the Stone and Bronze Ages in the sheltered bays of nearly all the lakes of France, Switzerland, S. Germany, Austria, and N. Italy. More recently the area of their distribution has been extended to Bosnia, Greece, Asia Minor, and probably other localities.

The remarkable development of lake-dwellings during the pre-historic ages in Central Europe seems to have come to a sudden end in the early Iron Age, and so completely had the system fallen into desuetude that scarcely a trace of it has survived in the local traditions of the districts in which such dwellings were most numerous. The habit of constructing houses built on platforms supported on piles is not, however, absolutely confined to pre-historic times, for we find from various books of travel that such habitations are still prevalent in various parts of the world—*e.g.*, in the Gulf of Maracaibo, the mouths of the Orinoco and Amazon, on the Coasts of New Guinea and Borneo, at Singapore, along the creeks and harbours running into the Straits of Malacca, etc. V. L. Cameron (*Across Africa*, London, 1877, ii. 63) describes three villages in Lake Mohrya, in Central Africa, with drawings of their picturesque appearance as seen from the shore. A. Goering (in *Illustrated Travels*, London, 1869–75, ii. 19–21) gives an account of a visit which he paid to the pile-dwellers of a tribe of Goajiro Indians in the neighbourhood of the town of Maracaibo, from which the following extracts may be interesting:

'In this way we reached the Goajiro village. Here a lively scene presented itself. The houses, with low sloping roofs, were like so many little cock-lofts perched on high over the shallow waters, and they were connected with each other by means of bridges, made of narrow planks, the split stems of palm trees. . . . Each house, or cock-loft, consisted of two parts, the pent-roof shelter being partitioned off in the middle; the front apartment served the double purpose of entrance-hall and kitchen, the rear apartment as a reception and dwelling chamber, and I was not a little surprised to observe how clean it was kept. The floor was formed of split stems of trees, set close together and covered with mats. Weapons and utensils were placed in order in the corners.'

Access was got to these villages from the shore by dug-out canoes, the inhabitants mounting to their 'cock-lofts' by a notched tree-trunk, which served as a ladder. Goering states that such villages are numerous along the shores of the great 'Lake,' or Gulf, of Maracaibo. 'The piles on which they rest are driven deep into the oozy bottom, and so firmly do they hold that there is no shakiness of the loftily-perched dwelling perceptible, even when crowded with people.'

Pile-structures are still more numerous in the east Indian islands. J. S. C. Dumont d'Urville (*Voyage de découvertes autour du monde*, Paris, 1836) describes the inhabitants of the bay of Dorei as living on four groups of pile-villages, each containing from eight to fifteen houses entirely constructed of timbers. Some of these houses have a double row of cells or cabins, separated by a passage which runs from end to end, and give accommodation to several families.

As early as 1860, F. Troyon (*Habitations lacustres*) quotes from the books of a number of travellers recording the existence of pile-structures in nearly all parts of the world; but little further information is to be derived from this class of evidence.

The discovery of an older lacustrine civilization in Switzerland was hailed by Irish antiquaries with the greatest enthusiasm, for it was only then that the significance of their own *crannogs* came to be fully realized; and henceforth *crannog*-hunting was pursued with renewed vigour. The Irish annals were now carefully searched for references to *crannogs*, and many of the localities thus indicated were identified and partly explored. In 1857 Wilde published the first part of his well-known catalogue of the antiquities in the Museum of the Royal Irish Academy, in which he gave an excellent account of the *crannogs*. In it he states that 46 were known up to date, and predicts that many more would come to light as the drainage of the country advanced—a prediction which has been amply verified, as every succeeding year has seen an increase to their number. Now the total number of Irish *crannogs* known and more or less explored is upwards of 200.

In 1857 Joseph Robertson read a paper on Scottish *crannogs* at the Society of Antiquaries of Scotland. The chief facts adduced by him consisted of historic references to island-forts, and submerged wooden structures exposed in the course of the drainage of lochs and marshes during the last two centuries. The first great discovery, however, which brought the subject on the field of practical research in Scotland, was made in the Loch of Dowalton, Wigtownshire, upwards of fifty years ago. In order to drain the extensive meadows occupying the western portion of the Dowalton valley the proprietor, William Maxwell, conceived and successfully carried out a project of draining the loch by cutting a new outlet through a narrow lip of rock which separated its waters from the lower grounds beyond. This excavation was completed during the summer of 1863, and, as the waters subsided, a group of five or six artificial islands gradually emerged from the bosom of the lake. The antiquarian remains collected on these islands ultimately disclosed a picture of early Scottish civilization hitherto unknown.

A descriptive account of the Dowalton *crannogs* was read by the Duke of Northumberland (then

Lord Lovaine) at the meeting of the British Association held at Newcastle-on-Tyne in 1863.

Two years later J. Stuart, secretary of the Society of Antiquaries of Scotland, visited Dowalton, and, owing to the more complete drainage of the loch, was enabled to examine the islands under more favourable conditions. The result of his labours was an elaborate paper to the Society (1866), in which he gave a detailed account of their structure and of the relics found on them.

The discovery and excavation of the Lochlee *crannog* (1878–79) was the beginning of a series of explorations, conducted under the auspices of the Ayr and Galloway Archæological Association, which culminated within a few years in the excavation of about half a dozen typical *crannog* sites throughout the counties of Ayr and Wigtown. The assortment of relics recovered from their débris indicates the range of their occupancy to have extended from the Romano-British period down to mediæval times. Since the publication of the reports on these excavations three other typical *crannogs* have been investigated in Scotland, viz. one in Lochan Dughaill, Argyllshire, one at Hyndford, near Lanark, and one in Asbgrove Loch, near Stevenston, Ayrshire. The Hyndford *crannog* is of special interest on account of the number of objects belonging to Roman civilization which were among its relics.

Until the discovery of the Glastonbury lake-village, in the spring of 1892, by Arthur Bulleid, the recorded indications of lake-dwellings south of the Scottish border are too meagre and fragmentary to call for any notice in this sketch. The excavation of the Glastonbury settlement has been in progress since its discovery, and is now completed. Its site occupies some 3 or 4 acres of flat meadow-land, within the boundaries of what is justly supposed to have been formerly a marshy lake. Before excavations were begun, all that the eye could discern was a group of low mounds huddled in the corner of a field. These mounds turned out to be the sites and débris of dwelling-huts resting on a foundation of layers of brushwood and the stems of small trees. These under-structures were sometimes bound together with transverse mortised beams, precisely similar to those so commonly met with in the Scottish and Irish *crannogs*. A thick palisading of piles and brushwood surrounded and protected the village. Its marginal boundary was very irregular, probably owing to the fact that enlargement of the original area of the village had been subsequently made by the addition of huts projecting from its sides. The huts were circular or slightly oval, and varied in size from 20 to 35 ft. in diameter. Each hut contained a central hearth, sometimes neatly made of flat stones embedded in the clay flooring which existed in all of them; and, as subsidence, due to the compression and decay of the under-structures, progressed, the occupants superadded new clay floorings, which on section showed a well-marked stratified appearance. Several hearths, five or six not being an unknown number, were thus observed to have been superimposed one above the other—precisely as was the case on the Lochlee *crannog*.

The relics collected on the site of this remarkable lacustrine village are so numerous and varied that they illustrate, with rare and singular completeness, the life-history of the community who inhabited it. They exhibit the special characteristics of 'Late Celtic' art, as it existed prior to the spread of Roman civilization in that part of Britain; and it is this fact that gives the Glastonbury collection an exceptional importance among the antiquarian remains hitherto discovered within the British Isles.[1]

[1] Within the last few years another lacustrine village has been discovered at a place called Meare, about two miles from Glastonbury, and is now in the course of being excavated during each summer. So far, both the structural and cultural relics disclosed at this new site are precisely similar to those of the Glastonbury village.

2. Structure of lake-dwellings.—It will be understood from the foregoing remarks that the structural details of lake-dwellings have to be gathered more or less from different, and sometimes widely separated, settlements, and re-constructed on the principles of comparative archæology. As regards the pile-structures of the Stone and Bronze Ages, everything—huts, platforms, and even the submerged piles, except their lower ends—has disappeared ages ago, either from natural decay or by conflagrations. The complete destruction of a lake-village by fire was by no means a rare catastrophe, and, strange to say, it was, from an archæological point of view, the most fortunate termination that could have happened to it. During the bustle and scrimmage consequent on the conflagration of such combustible materials not only did many articles of value drop into the water beneath, but some of the most perishable commodities, such as grain, fruits, bread, cloth, portions of the clay mouldings which covered the cottage walls, etc., were more or less charred before being deposited in the lake-silt—a condition which rendered them less liable to decomposition. It is by collecting, assorting, and comparing such fragmentary materials that archæologists are enabled to form some idea of the appearance and internal structure of these lacustrine villages, as well as of the culture, civilization, and domestic economy of their inhabitants.

The preliminary problem which had to be solved before habitable huts of any kind could be erected was the construction of a level platform, sufficiently elevated above the surface of the water to place the dwelling-huts beyond the action of the waves and floods. The methods adopted to secure this end may be briefly described.

(*a*) One method was by driving long piles of wood into the bed of the lake, leaving their tops projecting at a uniform height above the water, and then placing over them transverse beams with mortised holes, into which the tops of the piles were fitted—thus forming a platform capable of supporting human habitations, and, of course, varying in size according to the requirements of the community. That the earliest lake-dwellers had the requisite skill to accomplish such work is established beyond doubt by the discovery among the débris of nearly all the stations of mortised beams, tenons, portions of wood containing both round and square holes, together with a various assortment of wooden implements, vessels, etc. A common method of steadying the piles was to throw around them after being placed in position large quantities of stones. The stones were transported from the adjacent shore in canoes, one of which, still containing its load, was actually observed buried in the mud off the Ile de St. Pierre, in Lake Bienne, where it had evidently been swamped. These extensive collections of stones formed here and there a kind of submerged mound, which from time immemorial was locally known as a *Steinberg*. One or more of these *Steinbergs* have been found on almost all the sites of the pile-villages of the Stone Age. The long straggling settlement at Schaffis contained three, the largest measuring 217 ft. in length by 65 ft. in breadth. The fishermen, in order to prevent injury to their nets, were in the habit of pulling up these piles; and so abundant were they in the three great lakes known as the 'Jura waters' that they had become the source of a small industry among cabinet-makers, who had long recognized the valuable properties of the black oak for the manufacture of ornamental articles. A more striking appearance has rarely been seen than that which the stations of Möringen and Lattringen presented shortly after Lake Bienne became affected by the operations of the 'Correction des Eaux du Jura.' Photographs then taken show quite a forest of black stumps rising a few feet above the muddy bottom which then, for the first time, became exposed to view.

It is estimated that the actual number of piles used in the construction of some of the larger settlements was not far short of 100,000. One of the stations at Morges, in the lake of Geneva, was 1200 ft. long and 150 ft. broad; and the whole of this area was thickly studded with the stumps of the piles which formerly supported the village. E. von Fellenberg calculated, by counting the number of piles in one or two selected localities, that the entire number requisite for the Bronze Age settlement at Möringen could not have been less than 10,000.

In the construction of the earlier villages the piles were simply round stems of trees, but latterly, apparently for the purpose of economizing the wood, they were split into two and

sometimes into four portions—a structural feature said to be characteristic of the Bronze Age. It may also be noted that, when a Stone Age site continued in occupation during the Bronze Age, the débris of the latter settlement lay invariably on the outside of the former, showing that with the use of metal tools their constructors were enabled to plant the piles in deeper water. During the Stone Age the woodwork had been manipulated by stone implements—a fact which was clearly demonstrated by Keller on the occasion of the first discovery of the kind at Ober-Meilen. Here some of the piles, on being freshly pulled up, were observed to have their tips pointed by blunt implements, and it was experimentally ascertained that the cuts on them could be closely imitated by using the stone axes which were picked out of the surrounding mud.

(*b*) A second method by means of which lake-dwellers secured an adequate basis for their huts was to construct a series of rectangular basements of wood a few feet apart, each basement having its sides formed by a succession of horizontal beams lying one above the other, like the logs in a Swiss châlet. The ends of the beams overlapped for a few feet, and at the four crossings a few uprights were placed, apparently for the purpose of steadying the structure. These compartments varied in size from a few feet in diameter to as many yards. The lowest beams rested on the bed of the lake, and, when the requisite height above the water was reached, transverse beams to form the habitable platform were laid across, thus covering up the empty spaces underneath. This plan, which was probably selected for the purpose of saving the structural materials, may be regarded as analogous to the vaulted foundations of modern houses. Examples of such structures have been found in Lake Paladru in France (Merovingian period) and in the lakes of Persanzig, Arys, Daber, and in a few other sporadic lake-dwellings of the Iron Age in N. Germany.

(*c*) Contemporary with the pre-historic pile-structures already noticed, there existed throughout the same regions of Central Europe certain lake-dwellings which, instead of platforms supported on piles, had solid sub-structures composed of closely set timbers arranged in horizontal layers and often alternating with beds of clay. Such structures were commonly erected in the smaller lakes, and their remains are now generally embedded in peat. Characteristic specimens of this class belonging to the Stone Age have been investigated at Wauwyl, Niederwyl, Schussenried, and a few other localities. An artificial island in the lake of Inkwyl, near Soleure, was shown by C. A. Morlot to have been originally a pile-structure which at a later period had become consolidated into an island by the gradual accumulation of the débris of a lengthy habitation. Another in Lake Nussbaumen is, according to Morlot, surrounded by a circle of piles, after the manner of the Scottish and Irish *crannogs*. It has also been proved that the prettily wooded Isola Virginia in Lake Varese, though now about three acres in extent, was originally a pile-structure. At present it contains several buildings, one of which is a valuable archæological museum erected by the proprietor, Ettore Ponti.

It was, however, within the British Isles that the artificial islands, or *crannogs*, acquired their greatest development. Precise information as regards their structure has been supplied by an exhaustive investigation of a few Scottish specimens, notably those at Lochlee and Buston, in the county of Ayr, the result of which may be briefly summarized as follows.

A suitable locality having been selected—the topographical requirements seem to have been a small mossy lake with its margin overgrown with water-plants—the next consideration was the selection of materials for constructing the island. In a lake bed composed of many feet of decayed vegetable matter it is manifest that heavy substances, such as stones and earth, would be inadmissible, owing to their weight, so that solid logs of wood in the form of trunks of trees would be the best material that could be used. The plan adopted seems to have been to make in the first place a floating raft of tree-stems, brushwood, heather, bracken, etc., with which were mingled stones and earth. On this basis they continued to add similar materials until the mass grounded. It was then surrounded with a stockade in the form of one or more circles of piles united by intertwining branches, or, in the more elaborately constructed specimens, by horizontal beams with mortised holes to receive the ends of the piles. These horizontal beams were arranged in two ways. One set ran along the circumference and bound together all the uprights in the same circle, while others took a radial direction and connected each circle together, some of these radial beams being long enough to bind the uprights in three circles together. The mechanical skill displayed in the construction of these stockades was specially directed to give stability to the island, and to prevent superincumbent pressure from causing the general mass to bulge out laterally.

The internal structure of the Lochlee island was carefully ascertained by cutting a large rectangular hole near its centre down to the original silt of the lake—a depth of some 10 ft. from the lowest floor of the dwelling-house, or about 16 ft. from the original surface of the mound. The result of this was to show that nearly the entire mass was composed of the unbarked stems of various kinds of trees, from 6 to 12 ins. in diameter, laid in transverse layers one above the other. Interspersed here and there among the woodwork were some long slender oak planks, which appear to have formed a binding framework between the central parts of the island and its margin. One such beam, on having its attachments traced out, was found to have its inner end pinned by a long wooden peg to an adjacent large tree-stem, while its outer end was pinned to another slender oak plank which extended outwards and was similarly attached to the marginal structures.

Some of these *crannog* islands in Scotland and Ireland had been constructed of stones with or without a wooden foundation. According to G. H. Kinahan, the largest and most typical example of the stone *crannog* in Ireland is Hag's Castle, Lough Mask, Co. Mayo. As a Scottish example may be cited a mound on the margin of the White Loch of Ravenstone, Wigtownshire, explored a few years ago by Lord Borthwick and the present writer. It turned out to be a mass of stones, presenting a level surface of about 80 ft. in diameter and 6 or 7 ft. thick, resting on a foundation of large beams. On the surface of this mound were the foundations of stone buildings divided into five compartments.[1]

Most of the pile-structures of Central Europe had been connected with the shore by one or more gangways, supported on a double row of piles, with dimensions varying according to the requirements of each village. E. von Fellenberg informs us (Keller, *Lake-Dwellings*, p. 181 f.) that the bridge leading from the shore to the Bronze Age settlement of Möringen was about 200 yards in length, and nearly 20 ft. in width, while that to the Stone Age settlement in the same locality was considerably shorter, and only 5 to 8 ft. wide. The area occupied by piles at Robenhausen extended to about 3 acres, and the nearest point of the old lake shore was some 2000 paces distant; but yet, from traces of piles found in the peat, it would appear that a wooden bridge traversed the whole of this distance. Remains of similar approaches have occasionally been discovered in connexion with the later dwellings of the Iron Age, both in N. Germany and in the British Isles. Some of the Scottish and Irish *crannogs* were also accessible by a submerged stone causeway, the existence of which had become known in some instances only upon the drainage of the lake. It has been conjectured that such submerged approaches might have been intentionally constructed so as to supply to the initiated a secret means of escape in emergencies—an idea strengthened by the zig-zag direction presented by some of them, such as a stone causeway in the Loch of Sanquhar. Other *crannogs*, however, appear to have been completely insulated and accessible only by boats. The frequency with which canoes have been disinterred from the débris of lake-dwellings of all ages shows how prevalent and widely distributed was their use as a means of communication with the shore. These primitive boats, whether emanating from a Swiss *Pfahlbau* or from a mediæval *crannog* of the British Isles, were almost invariably dug-outs, and presented no special feature either in form or in structure by which their age or provenance could be determined.

The evidential data, on which our knowledge of the structure of the actual habitations of the lake-

[1] During the last few years a preliminary survey of the artificial islands in the Highland lochs, preparatory to excavating the more promising sites, has been completed by F. Odo Blundell of St. Benedict's Monastery, Fort Augustus, under the auspices of a Committee of the British Association. Several interesting reports have already been published by the Association, as well as in the *Proceedings of the Society of Antiquaries of Scotland*. For the year 1914 a small grant has been obtained from the Carnegie Research Fund towards the expense of investigating the artificial island in the Loch of Kinellan, Ross-shire.

dwellers is founded, consist of portions of burnt clay mouldings, the position of hearths and culinary implements, traces of walls and partitions, the disposition of food refuse, etc. The inference from the clay castings is that the timbers which formed the walls of the huts had been placed close together in an upright position, and then plastered over with puddled clay. Burnt clay impressions found at Robenhausen indicated timbers about an inch and a half in diameter, but other fragments indicated merely a kind of wicker-work. It may be noted that clay mouldings found in Lake Bourget, supposed to have been portions of the ceiling of a room, were ornamented with concentric circles and parallel lines. Other burnt fragments from the same locality were portions of the funnel of a small furnace or stove.

As to the form of the huts archæologists are divided in opinion, some, in their ideal restorations, figuring them as circular, and others as rectangular. F. Troyon, judging from some clay casts found at Wangen, came to the conclusion that they were circular, and, accordingly, figures them as such in his *Habitations lacustres*. On the other hand, E. Frank, the investigator of Schussenried, came upon the foundations and portions of the walls of a cottage embedded in peat. The structure was rectangular, measuring 33 ft. in length and 23 ft. in breadth, and was divided into two compartments by a partition. The walls and partitions were constructed of split stems of trees set upright, and plastered over with clay. On the south side there was a door, a little over 3 ft. wide, which opened into one of the chambers. The flooring of both these chambers was composed of four layers of closely laid timbers separated by as many layers of clay. These repeated floorings may have been necessitated by the gradual rise of the surrounding peat, which ultimately compelled the inhabitants to abandon the dwelling altogether.

The diameter of the circular area enclosed by the stockades at Lochlee was about 60 ft., and in its central portion there was a space, measuring 39 ft. square, paved with closely laid beams like railway sleepers, and along each of its sides were the stumps of posts, apparently the remains of a wooden wall. A row of similar stumps divided the paved area into two compartments. Five or six superimposed hearths occupied the middle of the northern compartment, and the doorway, clearly defined by portions of two stout posts, was situated on the south side, while facing it on the left was an immense refuse heap, beyond which were the remains of a gangway connecting the island with the shore. On the other hand, the structural remains on the Buston *crannog* indicated one large circular dwelling-house, a form of habitation which was also disclosed by the excavation of the *crannog* in Lochan Dughaill. We have already seen that the huts of the Glastonbury lake-village were more or less circular. It may, therefore, be inferred that both forms were indiscriminately used by the lake-dwellers not only during the prehistoric period, but also during the subsequent ages in which such structures were in vogue.

On the pile-structures proper the hut floor was made of clay mixed with rushes, and over this was placed the hearth, which consisted of a few flat stones embedded in clay. From discoveries made at Niederwyl, Jacob Messikommer (Keller, *Lake-Dwellings*, p. 73) concluded that the roofs of the huts in that settlement were thatched with straw and rushes. That thatch of some kind was used in Western Europe in proto-historic times finds some corroboration in the writings of classical authors.

Thus, Strabo (IV. iv. 3) writes that the Belgæ lived in 'great houses, arched, constructed of planks and wicker-work, and covered with a heavy thatched roof'—a description which correctly applies to many of the Scottish *crannogs*.

3. Culture and civilization of the lake-dwellers of Europe.—There is no class of antiquities which gives greater support to the general accuracy of the chronological sequence of the so-called three ages of Stone, Bronze, and Iron than the various collections of lake-dwelling remains which are to be seen in the archæological museums of Europe. Founded in the Stone Age, these pile-structures continued to flourish during the whole of the Bronze Age, and even overlapped into the early Iron Age, so that the period of their duration entirely covers the introduction and development of bronze into Middle and Western Europe. It is beyond doubt that from the very start the lake-dwellers were acquainted with, and sedulously practised, various arts and industries, that they reared most of the ordinary domestic animals, and that they cultivated the growth of flax, fruits, and various kinds of cereals.

Several varieties of cloth, fringes, nets, cords, and ropes were brought to light by Messikommer from the very lowest relic-bed at the Stone Age station of Robenhausen; and even specimens of embroidery were found at the adjoining station of Irgenhausen. Remains of linen cloth, thread, nets, basket-work, etc., have also been found on many other stations, as at Vinelz, Locras, Schaffis, Lagozza, Laibach, etc. The absence of such fragile relics from other stations is not to be taken as evidence that their inhabitants were unacquainted with such industries; for it is only when fabrics are carbonized, or deposited in circumstances exceptionally favourable to their preservation, that they resist for a prolonged period the process of natural decay. Thus, at Schussenried, though there was no actual specimen of cloth found, the impression of a well-woven fabric was clearly visible on a consolidated mass of wheat—probably that of the sack in which the grain had been stored. At Laibach, a similar impression was observed on a fragment of pottery. In the museum at Freiburg (Switzerland) there is a carbonized spindle from Lake Morat, which shows fine threads still coiled round it; and Gross figures a similar object from Locras.

One of the stations at Moosseedorf-See, which was carefully investigated by the experienced archæologists Jahn, Morlot, and Uhlmann, yielded a large assortment of the osseous remains of animals, among which the following were supposed to have been in a state of domestication: dog, sheep, goat, pig, and various kinds of oxen. A few bones and teeth of the horse were also found, but these might have belonged to the wild species, as it is not agreed that this animal was domesticated till the Bronze Age. The cultivated plants recorded from this station were barley, two kinds of wheat, pea, poppy, and flax. At Wangen two varieties of wheat and the two-rowed barley were distinctly recognized both in whole ears and as detached grain—the latter in quantities that could be measured in bushels.

That the ceramic art was well known to, and practised by, the early lake-dwellers is amply proved by the quantity of pottery, mostly fragmentary, indicating bowls, plates, cups, jugs, spoons, and large vessels, now stored among lacustrine relics in the various museums throughout Europe. These vessels were made without a knowledge of the potter's wheel, and the paste frequently contained coarse sand or small pebbles; but a finer kind was also used for the manufacture of smaller vessels. Generally speaking, they were coarsely made in the earlier stations, having perforated knobs instead of handles; yet examples are occasionally found which show that handles

were not unknown. The ornamentation consisted of finger- and string-marks, irregular scratchings with a pointed tool, raised knobs, and perforations round the rim, together with dots and lines variously combined.

For the prosecution of the ordinary avocations of social life the lake-dwellers were in possession of a varied assortment of tools and implements, the precise function of some of them being, however, difficult to determine. They used axes, knives, saws, scrapers, borers, etc., of flint and other hard stones. Cutting instruments, pointers, chisels, etc., were also made of horn, bone, and the tusks of the wild boar. With such tools they constructed wooden houses, scooped out canoes, and shaped wood into various kinds of dishes, clubs, and handles.

The food supply derived from agriculture and the rearing of domestic animals was supplemented by the produce of hunting, fishing, and gathering such seeds and fruits as nature produced in the vicinity. The weapons and tools used in these pursuits are abundantly met with. Arrow- and spear-points of flint, and sometimes of rock-crystal and jade, or other mineral, and of bone, are common among lake-dwelling remains; and even a few of the bows made of yew wood, notwithstanding their liability to decay, have come to light—two from Robenhausen, and one from each of the stations of Vinelz, Sutz, and Clairvaux.

The introduction of cutting implements of bronze into general use among the lake-dwellers gave a great impulse to the advancement of all the industries and ordinary affairs of life. In lieu of the primitive weapons and tools previously in use, we now meet with a splendid array of swords, daggers, lances, axes, knives, razors, chisels, gouges, sickles, etc., all made of the new material. The simple dagger of bone or flint, which could be used only by a thrusting blow, not only became more effective, but developed into a new weapon—the double-edged sword. Indeed, all weapons, implements, and ornaments underwent more or less evolutionary improvements, the various stages of which can be readily traced by a comparison of extant specimens. Thus, the primitive stone axe at first retained the same form in bronze, and, as such, had a wide distribution throughout Europe; but it gradually succumbed to the flanged type, with or without a loop, till finally all forms gave way to the socketed implement, which appears to have been regarded as the best form of axe prevalent in the Bronze Age. It was only when iron superseded bronze in the manufacture of cutting implements that the modern type of axe, *i.e.* with a transverse socket, came into general use.

In the category of ornaments and articles of the toilet there falls to be considered a large assortment of new and fanciful forms, such as bracelets, pendants, necklaces, fibulæ, pins, combs, belt-clasps, finger-rings, buttons, studs, ear-rings, chains, and a few trinkets of gold, amber, and glass.

That the horse was in a state of domestication among the lake-dwellers during the Bronze Age we have very circumstantial evidence, in the discovery of bridle-bits and various ornaments for harness, as well as a wheel and other mountings of a carriage.

These progressive innovations in domestic and public life could hardly fail to influence the art of the potter. Accordingly, we meet with a better quality of paste, greater variety and elegance in the style and form of vessels, and some approach to systematic decoration. Ultimately colouring materials were utilized, which considerably enhanced the effect of the geometric style of ornamentation. Besides patterns of recurring figures, formed by impressions in the soft clay, we occasionally find similar patterns traced on the surface of vessels in thin strips of tin-foil made to adhere to the dish by means of a kind of gum or asphalt. Such vessels were made of fine black paste, with a smooth surface, and were extremely elegant in shape.

Lacustrine archæology does not supply the materials requisite for a review of the culture and civilization prevalent in the early Iron Age, as no lake-dwellings have been discovered showing a transition in the manufacture of bronze and iron objects. Iron appears in a few instances, towards the close of the Bronze Age, as in ornamental bands encrusted on a few swords and bracelets, but there are no tools or weapons of the transition stage, such as was the case at Hallstatt, where iron is seen, as it were, competing with bronze in the manufacture of all kinds of objects. On the contrary, the few objects of iron found on the sites of one or two of the Swiss lake-dwellings are mostly La Tène types, which, of course, are very different, not only in material, but in form and technique, from those of the previous age. On these stations not only were iron objects of La Tène forms found, but also Roman tiles, pottery, and coins. The introduction of iron into general use in Europe seems, therefore, to have been the work of an alien people who subjugated the lake-dwellers and destroyed their villages. On the other hand, the sporadic lake-dwellings found outside the area of these earlier habitations belong almost exclusively to the Iron Age, and their respective inhabitants had no common bonds of affinity. The vast majority of the Scottish and Irish *crannogs* flourished from the Romano-British period down to the 17th cent.—a statement which, according to R. von Virchow ('Die Pfahlhauten des nördlichen Deutschlands,' *ZE* i. [Berlin, 1869]), is applicable to their analogues in N. Germany.

The well-known station of La Tène, regarded by the earlier *lacustreurs* as a true lake-dwelling of the Iron Age, is now shown to have been an *oppidum*, or fort, of the Helvetians, erected at the outlet of the lake when its waters stood at a lower level than they did immediately before the 'Correction des Eaux du Jura.' The remarkable assortment of weapons, implements, and ornaments collected from this site gives a striking picture of the metallurgical skill to which their owners had attained prior to the influence of Roman civilization in Gaul. The style of art disclosed by them seems to be closely allied to that known in Britain as 'Late Celtic,' as represented, *e.g.*, by the relics found on the Glastonbury lake-villages; and so important is this group considered by archæologists that the name 'La Tène' has become a generic expression for those well-defined Marnian remains which are Celtic in origin, and are not to be confounded with those classified as Greek, Roman, Etruscan, or Phœnician.

4. Terremare.—Shortly after the middle of the 18th cent. certain artificial mounds of an earthy substance found scattered here and there over some of the eastern provinces of the Po valley became known to agriculturists as possessing great fertilizing power—a property which was henceforth turned to account by using their contents as a field manure. To such an extent has this practice been carried on that, out of about 100 sites then known, few now remain. On the removal of a few feet of surface soil the fertilizing materials come to view in the form of stratified deposits of clay, sand, ashes, etc., of various colours—yellow, brown, green, and black—shown conspicuously on section as parallel bands running across the mound. The finer materials, procured by riddling, are sold to the farmers under the name *marna* or *merne*;

and hence these mounds are now known in scientific literature as *terremare*. In course of these annual excavations a number of antiquarian objects were encountered by the workmen, such as fragments of pottery, Roman coins and tiles, implements of bronze, bone, and horn, the bones of domestic and wild animals, and occasionally those of men. These discoveries for a long time failed to lead to any scientific investigation, and, when the mysterious mounds happened to be noticed by the early writers of last century, each had a theory of his own to account for them. The celebrated naturalist G. Venturi (1822) assigned them partly to the Boii, a Celtic race who here cremated their dead warriors and ceremonially threw their weapons and animals taken in war into the burning pile, and partly to the Romans who subsequently inhabited the country and selected these mounds as burial-places. Others supposed them to have been the sacred and traditional cemeteries of successive races, and hence their contents were called cemetery-earth (*terra cimeteriale*); and it is a curious fact that many of these truncated mounds are to this day crowned by a modern church or convent, around which the Christians have been in the habit of burying their dead. B. Gastaldi thought the stratification of the deposits could be accounted for only by the intervention of floods and inundations, such as the annual overflowings of the Po and the bursting of the numerous torrents which descend from the Apennines.

These and similar theories, based on the supposition that the *terramara* mounds were the abodes of the dead, were not, however, in harmony with the domestic character of the pottery and industrial implements which were turned up. The starting-point of a long series of researches which ultimately solved the problem was the announcement, in 1861, of P. Strobel that the remains of a *palafitte*, analogous to those found in lakes and peat-bogs, were to be seen below the true *terramara* beds at the station of Castione dei Marchesi, near Borgo San Donnino, in the province of Parma. This discovery aroused much speculative interest, especially when correlated with the researches initiated by B. Gastaldi regarding pile-dwellings in lakes and marshes, the existence of which, in Italy, had just then been proved by the discovery of their remains in the peat-bog of Mercurago and in Lake Garda.

Reflecting on these novel revelations, Strobel and Luigi Pigorini, both then residing at Parma, began a series of investigations regarding the *terremare* in their own vicinity, the outcome of which was a joint report, first published in 1862 as part of Gastaldi's well-known work, *Nuovi cenni sugli oggetti di alta antichità trovati nelle torbiere e nelle marniere dell' Italia*.[1]

Interest in the whole subject now rapidly increased, and extended to agriculturists and local observers. Yearly excavations were carefully scanned for antiquities, and special excavations in the interests of science were even undertaken by the State. The outcome of these elaborate researches has been to show that a typical *terramara* settlement was virtually a land *palafitte*, trapezoidal in shape (with two sides always parallel), and orientated—the degree of orientation being dependent on the direction of the sunrise when the settlement was founded. In their construction one uniform plan was adopted.

Having selected a site suitable in size to the requirements of the community, the constructors proceeded to surround it with a moat, the excavated materials being thrown up in the form of a dike or rampart on the inner bank. The inside edge of this dike was then lined with a series of small rectangular enclosures made of horizontal beams laid one above the other, as in a Swiss châlet. The beams, which were roughly hewn and partially mortised at the points of crossing, projected irregularly beyond the enclosed spaces, some extending as far as the adjacent compartments. The interior of these log-houses was then filled with rubbish—clay, gravel, pottery, bits of wood, etc. From special investigations conducted at Castione, Pigorini came to the conclusion that the purpose of this curious structure was to support the inner side of the earthen dike (*contrafforte dell' argine*), and so give it a perpendicular facing. The area thus enclosed was then thickly planted with stakes, the tops being brought to a common level, and over them a wooden platform was laid. On this platform, huts, made of light timbers and plastered over with clay, were erected. Thus, in a very simple manner, was constructed a fortified village, access to which was secured by a wooden bridge spanning the surrounding moat. The vacant space beneath the common platform became a convenient receptacle for all sorts of refuse, including lost and worn-out objects of industry. When, in the course of time, the space became filled up, the *terramaricoli*, in order to avoid the labour of removing the débris which would have accumulated around them, adopted the ingenious plan of constructing a brand-new platform above the former. It seems that, in some instances, a preliminary step to the carrying out of this project was to set fire to the entire village, thus at one coup getting rid of all sanitary difficulties as well as of a number of uninvited guests. Having started *de novo* with a clean bill of health, they elevated the surrounding dike to the requisite height, and planted stakes, as formerly, over the habitable area for the support of the new platform. This mode of procedure appears to have been repeated over and over again, until in the course of time the successive deposits accumulated to a height of 15 or 20 feet.

Of subsequent discoveries the most remarkable were the result of systematic excavations on the *terramara* of Castellazzo di Fontanellato, in the province of Parma, conducted by Pigorini at suitable intervals during the summers of 1888 to 1896.

In this station the surrounding moat was 30 metres wide and 3½ deep below the original level of the plain. It was kept supplied with water from a neighbouring stream by an artificial canal, and in another part there was an overflow canal only half a metre in depth, so that water always remained in the moat to a depth of 3 metres. Along the inside of the moat there was a rampart, 15 metres broad at the base, having its outer side sloping and its inner side vertical—being kept in this position by a *contrafforte*. Although the woodwork of this structure had almost entirely decayed, there was no difficulty in recognizing that it was similar to that of Castione, already described. The only access to the interior was by a wooden bridge, from which the main street, 15 metres wide, extended midway between the two parallel sides of the fort. Along the middle of the east rampart and a little to its inside, there was a raised mound of earth, 100 metres long and 50 broad, surrounded by a moat and a *contrafforte*, and crossed by three bridges. This was the citadel of the village, and within it was an open trench, at the bottom of which were five rectangular pits in a row, each of which had been covered with a wooden lid. These receptacles are supposed to have been for ritual purposes, and are regarded by Pigorini as the prototypes of analogous pits found in Roman camps, such as those described by M. Jacobi of Homburg as occurring in the *Limes Germanicus*. Facing the middle bridge of the citadel, another street, but only half the breadth of the former, ran across the settlement, at right angles to the main street. Pigorini has also pointed out that these two intersecting streets are virtually the same as in a Roman camp, with its *cardo maximus* and *decumanus maximus*. Other streets ran parallel to the two main roadways, and thus divided the whole habitable area into rectangular divisions of equal size. All the spaces formed by the intersection of the streets contained traces of the piles which had supported the wooden platforms on which the huts had been erected.

Among the more important results of the investigations at Castellazzo was the discovery of two cremation cemeteries containing vases with calcined bones. One, situated near the south-east corner of the village, was of a square shape, each side measuring 165 metres. On being examined, this necropolis turned out to be a veritable pile-structure, having rows of cinerary urns placed close together, not, however, on the ground, but on a wooden platform. It was surrounded by a moat, 10 metres broad and 1·60 metres in depth, from which it would appear that the houses of the dead were constructed on the same plan as those of the living.

The station of Castellazzo was by no means a newly discovered site when Pigorini began his investigations, as its fertilizing earths were excavated by the peasants from time immemorial. The relics

[1] This work was translated into English by C. H. Chambers under the title of *Lake Habitations and Pre-historic Remains in the Turbaries and Marl-beds of Northern and Central Italy*, and published in 1865 by the Anthropological Society of London.

found on it from time to time had not been carefully collected, but nevertheless a goodly number had been sent to the museums of Parma and Rome. They are similar to the ordinary relics characteristic of the *terremare*, such as pottery (including the famous *ansa lunata*), loom weights, terra-cotta figurines of animals, and various objects of deer-horn, together with an assortment of Bronze Age implements, weapons, and ornaments.

The opinion of Pigorini and other Italian authorities is that the original lake-dwellers came into Italy from the great highway of the Danube by way of Croatia, Carinthia, and Venetia. On reaching the Po valley, they founded settlements in the lakes of Garda, Fimon, Arquà, and others during the transition period between the Stone and Bronze Ages. In the lake of Garda the settlements were numerous, and some of them continued to flourish down to the early Iron Age. In moving westwards these immigrants followed the left bank of the Po, founding settlements in the intermediate lakes, until they reached the lakes of Varese and Maggiore, which henceforth became their headquarters in the western part of the valley. Meanwhile the early settlers who remained in the eastern district began to found lake-dwellings (*palafitte*) on swampy ground, the lakes here being too few to afford suitable accommodation for their increasing agricultural and pastoral pursuits. Subsequently they crossed to the south side of the Po, where, the land being low-lying and subject to inundations, they continued their inherited system of habitations with the addition of having them fortified by a moat and a rampart. The crossing of the Po, which doubtless was a great military achievement, is supposed to have taken place at Viadana, and it is worthy of note that the great camp of Castellazzo was in the vicinity, on the frontier of the territories of the Ibero-Liguri, the original inhabitants of the country—a fact which seems to the present writer to have been the *raison d'être* for the exceptional defences of the *terramara* villages of Western Emilia. On the east side, towards Bologna, the hut-constructors of the Stone Age were conquered and subjugated by the *terramaricoli*, who then installed themselves in their hut villages—thus accounting for the remains of the two civilizations being met with in the stations and habitable caves all along the coast of the Adriatic. Gradually these *terramara* folk moved southwards, and, according to Pigorini, became the actual founders of Rome. At any rate, a typical *terramara* station has been discovered as far south as Taranto.

5. Terpen.—We now proceed to inquire if structures analogous to the *terremare* are found elsewhere in Europe. It is a remarkable fact that, notwithstanding the striking appearance which the Swiss lake-villages must have presented to strangers, classical writers are absolutely silent about them. Such reticence does not, however, apply to the class of remains now about to be described. Before the construction of the great sea-dikes of Holland, the whole of West Friesland would have been in that hybrid condition described by Pliny (*HN* xvi. 1), in which it was difficult to say whether it belonged to sea or land:

'Here a wretched race is found, inhabiting either the more elevated spots of land, or else eminences artificially constructed, and of a height to which they know by experience that the highest tides will never reach. Here they pitch their cabins; and, when the waves cover the surrounding country far and wide, like so many mariners on board ship are they,' etc.

At the present time this region is studded with certain low mounds called *terpen*. From a map of their geographical distribution recently issued by the Friesch Genootschap, it appears that their number in Friesland alone amounts to 500, of which 200 have already been excavated. Of the remaining 300 many are not available for either agricultural or archæological purposes, being occupied by villages, churches, cemeteries, etc. Like the *terremare*, these *terp*-mounds have for a long time been excavated on account of their rich ammoniacal deposits, which are used by agriculturists as guano; but, until they accidentally attracted the attention of archæologists, nobody seemed to have given a thought to their origin. As their excavation is prosecuted solely in the interests of agriculture, little attention is paid to the position of the archæological treasures which they contain. Either a canal or a railway siding is conducted to the perpendicular facing of the excavation, and from it the transporting boats or waggons are filled. Most of the larger antiquarian objects are thus secured, but many of the smaller articles, such as beads and ornaments, escape observation. From the relics thus collected the curator of the Leeuwarden Museum has the privilege of selecting any that he thinks necessary for the national collection, but the rest may be sold or disposed of privately.

As to the origin of the *terpen*, they are now proved to have been originally constructed as pile-dwellings, at least as regards some parts of their interior; and some of them are probably the actual mounds described by Pliny. The *modus operandi* was, in the first place, to raise a circular ring-mound of mud during ebb-tide. When this mound was sufficiently elevated to keep the waves outside, wooden platforms supported on short stakes were erected in the interior, and on these huts were placed. As the rubbish accumulated the process was repeated until the interior became a solid mound, precisely like what took place in the *terremare*. The towns of Leeuwarden and Leyden are said to be built over one or two *terp*-mounds. The industrial remains collected in the course of the excavations of the *terpen*, and carefully preserved in the museum of the Friesch Genootschap at Leeuwarden, give a vivid picture of the culture and civilization of their inhabitants from pre-Roman times down to the 12th century.

Among the relics the following may be noted: egg-shells (hen and goose), some of which were unbroken; a flute made of the shank bone of an animal; Anglo-Saxon, Byzantine, and Roman coins; wooden spades; large casks for storing water; canoes; bone skates; clay loom weights; toilet and weaving combs; beads of amber and glass; quantities of the débris of flax; mittens with one stall for the thumb; cock-spurs, etc. Latterly fibulæ of La Tène types, Roman tiles and pottery (*terra sigillata*)—some specimens of the latter having makers' marks on them—bridle-bits of iron, bronze pots, and Merovingian brooches have come to light; but no objects characteristic of the Bronze Age.

During the year 1905 a number of urns and human skeletons were found in a localized spot within a *terp* near Leeuwarden. Some of the skeletons were enclosed in coffins made of the hollowed trunks of trees and some in wooden boxes. The cinerary urns were hand-made, and are regarded as of Saxon origin, dating from the 5th or 6th cent. A.D. There were, however, a few wheel-made urns, which are considered to be the work of the Franks, as the wheel was not used in Friesland, either by the Saxons or Frisians, till the 10th or 11th century.

Osseous remains representing the following animals are abundantly met with: horse, ox (several varieties), cat, dog, sheep, wild boar, deer, roe, and fallow-deer. Among the skulls of these animals are one or two of the four-horned sheep. It may be of interest to note that the bones of this animal were among those identified by W. R. Wilde as coming from the *crannog* of Lagore in Ireland.

Analogous structures, under the names 'Warfen' and 'Wurfen,' have been described in the low-lying regions of East Friesland, the fen district of Holland, the embouchure of the Elbe, and, indeed, in nearly all the marshes along this part of the North Sea coast (see *Munro Lectures* for 1912, p. 445 f.).

6. Pile-structures in rivers.—Habitations erected over the margins of rivers, though possessing features common to both lake-dwellings and *terremare* proper, yet differ in other respects so much that they must be treated as a separate group.

(*a*) *Butmir* (Bosnia).—The fertile plain of Ilidze, occupying the centre of a wide basin, about 11 kilometres long by 7 broad, has been formed by sedimentary materials imported by numerous streams from the surrounding hills, which, by their junction here, give rise to the river Bosna. In earlier times this basin was more or less a lake, and, indeed, in winter parts of it are still submerged. Almost in its centre there is a portion of land covering several acres, which, on careful inspection, is seen to be a little more elevated than the part of the plain in its immediate proximity. This elevation was selected by the Government as the site of offices for a model farm; and, when, in 1893, excavations for the foundations of these buildings were begun, it was discovered that all this raised area was composed of the refuse of early human occupancy. This pre-historic settlement, or workshop, as some suppose it to have been, is now known under the name of 'the neolithic station of Butmir.' Part of the area is now occupied by a large dairy and other buildings, and the rest of it has been excavated for scientific purposes. A perpendicular section, specially prepared to show the position and nature of the materials of which the elevation was composed, disclosed the following deposits in successive strata from above downwards.

On the surface were 12 to 16 inches of clayey soil; then a blackish streaky mixture of clay mould, charcoal, etc., arranged in wavy and more or less parallel strata. The depth of this heterogeneous mass was from 3 to 5 feet, and it was in it, dispersed apparently throughout its entire contents regardless of depth, that all the relics were found. Beneath this again was a natural deposit of fine yellowish clay, very adhesive and well adapted for the manufacture of pottery. The discovery of hollows, extremely variable both in size and in form, in this underlying virgin clay, suggested to W. Radimsky, the superintendent of the excavations, the idea that they were the foundations of the original huts of the inhabitants. The subsequent discovery of a number of round holes in these hollows, which were readily recognized as having been formed by wooden posts, because, although the wood had entirely decayed, the spaces had become filled up with débris, gave rise to the theory that the settlement was really a pile-structure—an opinion which the present writer has supported on the following grounds: (1) the extreme irregularity in form and size of the so-called hut-foundations; (2) the occasional presence of pieces of charcoal, pottery, and other débris on the surface layer of the virgin clay, thus showing that the deposition of the latter had not entirely ceased when the settlement was founded; (3) the presence of some of the idols and other relics among the stuff which lay in these hollows, together with the entire absence of hearths or evidence of fire in any of them; (4) the general horizontality of the strata which, in section, were seen to run across the margin of the hollows without any break in continuity; (5) at various levels throughout the débris were to be seen portions of burnt and beaten clay platforms, as well as clay casts of the timbers which formed the walls of the huts.

A peculiarity of the Butmir station was the scarcity of organic materials; not even a bone or wooden handle remained, although, from the abundance of perforated stone implements, such objects must have been largely used—all having apparently disappeared by natural decomposition. Quantities of charred corn were found in different places throughout the débris. That grain and seeds were largely used as food is inferred from the fact that no fewer than 900 stone grinders, including fragments, were found throughout the station. The industrial remains consist of about 70 fragments of idols, mostly in human form, quantities of broken pottery, including some with beautiful spiral ornamentation, and a large assortment of polished stone implements—knives, saws, scrapers, borers, chisels, hammers, axes, and adzes —but no metal object is among the collection.

(*b*) *Ripać.*—The village of Ripać lies on the east bank of the river Una, a tributary of the Save. Here the stream widens into a kind of lake in which are two small islands accessible by wooden bridges supported on piles. Like other Bosnian rivers, the water of the Una holds in solution a large amount of calcareous matters which, on exposure to the atmosphere, are deposited, causing in some localities barriers across the stream. The miniature falls and currents by which the waters escape over these barriers are often utilized as the motive-power of corn-mills. At Ripać there is such an obstruction stretching from the larger island to both shores, and along it may be seen a row of these little mills, in the form of wooden cabins planted on tall piles. In course of removing some obstructive materials to the free escape of the water from the small water-wheels, the workmen encountered the stumps of thickly-set piles in a blackish relic-bed containing fragments of pottery, clay weights, broken bones, etc. This discovery was recognized to be of so much importance that the Government gave orders to have the locality investigated under W. Radimsky, the chief inspector of mines. Exploratory operations were carried on during the summers of 1893 and 1894, and it was then ascertained that a prehistoric pile-structure not only occupied the whole space between the islands, but also embraced a considerable portion of the larger island and the bank of the river. The upper deposits contained only Roman and later remains, but in the true culture-bed underneath were found burnt beams, organic materials, portions of platforms and huts, and a large assortment of relics of the pre-historic period. The piles were mostly made of oak stems, sometimes split and perforated, but of these only the stumps remained; and there were two sets of them, a lower and an upper, which suggest an earlier and a later structure. There was also evidence that the settlement, or at least a portion of it, had been destroyed by a conflagration; but this catastrophe did not bring it to an end.

The objects collected were made of iron, copper, bronze, silver, lead, stone, clay, glass, bone, wood, and vegetable fibre. Among the relics were numerous articles characteristic, not only of the Stone and Bronze Ages, but of the well-defined periods of Hallstatt and La Tène, thus proving that the habitation was occupied continuously from the end of the Neolithic Age till taken possession of by the Romans. During the Middle Ages the larger island became a fortified castle.

Radimsky states that indications of similar pile-structures are to be seen at several other localities on the river Una, viz. at Goluhic, Ribić, Kralje, and Brekovica.

(*c*) *Donja Dolina* (Bosnia).—The site of this pile-structure is on the south bank of the river Save, a tributary of the Danube. Here an oval-shaped terrace, some 500 paces in length and half this in breadth, presents a steep front to the river, but elsewhere falls away, except at the west end, where the escarpment turns abruptly inland, forming the bank of what was formerly a bay in the river. The surface of this terrace is 3 or 4 metres higher than that of the surrounding land, and is almost the only spot in the neighbourhood that is not submerged during the periodical floodings of the Save. It is called 'Gradina,' *i.e.* 'fort,' by the peasants; and here, during heavy floods, they find shelter for themselves and their cattle; and for the same reason it contains two village cemeteries—one for the Catholics and one for the Orthodox Protestants.

For several years, articles of antiquarian value from the vicinity of Donja Dolina were now and again presented to the Landesmuseum at Sarajevo —a fact which at last induced Ciro Truhelka, head of the archæological department, to visit the

locality. On walking along the river, at the foot of the 'Gradina,' he observed the tops of oak piles protruding through the river mud, while scattered around them were fragments of pottery, spindle-whorls, prism-like objects of burnt clay, worked portions of deer-horn, etc., from which he concluded that before him lay the débris of a pre-historic pile-structure. Excavations were begun in the following year (1900), and continued for several successive seasons when the water-level of the Save was favourable. The results are of great archæological importance from the wealth and variety of the relics discovered, and the ability with which they are recorded in two magnificently illustrated reports by Truhelka (*Wissensch. Mitt. aus Bosnien und der Herzegowina*, ix. [Vienna, 1904] and xi. [do. 1909]).

From the very beginning of the excavations it became evident that the structural details of this settlement deviated, in many respects, from the ordinary *Pfahlbauten* as hitherto known in Europe. The first interesting discovery was a row of piles running parallel to the river, which proved to have been the under portion of a palisade against the current, as the piles were bound together by inter-twining willow thongs. In continuing the excavations inwards, the excavators brought to light the remains of several houses supported on wooden posts. These posts were thickly set, no fewer than 978 having been counted over an area of 1160 square metres—nearly one for every square metre. Many of them, however, belonged to a later period, and were inserted to strengthen old timbers for the support of new houses. They were for the most part made of oak tree-stems, seldom split or squared, and well pointed with sharp metal tools. A little back from the river palisade there was a raised promenade from which a sloping gangway gave access to the underground vaults containing the supporting piles, as well as to the platforms on which the houses had been erected. Little of the structural details of the dwelling-houses remained, except the foundations of the partition walls and some loose spars and boards, which crumbled into dust as soon as they were exposed to daylight. During the excavations the sites of eleven houses were exposed, all of different dimensions, one measuring 4·5 metres by 6 metres, and another 6 by 9 metres. By comparing the more perfect remains from different sites, a fairly correct idea of their plan and internal arrangement was obtained. Each consisted of a large room and one or two smaller compartments. The former was regarded as the kitchen, with a fire-place, a hearth, and an oven made of well-burnt clay.

It is difficult to determine the former extent of this singular settlement. Strong stumps of piles were met with over a large area of the adjacent river-bed. It has also been ascertained that during the digging of graves in the Catholic cemetery the same class of relics were often thrown up. From these and other suggestive facts, it has been conjectured that the whole of the 'Gradina Hügel' consists of the débris of pile-dwellings—an area approximately amounting to 25,000 square metres.

That the underground vaults were sometimes utilized as cattle-pens was made evident by the large amount of animal dung that had accumulated in some of them. But this was not the only use to which they were put, as in several instances cinerary urns and wooden coffins (the latter containing human remains) were found. One coffin, that of a child, had the skeleton below the pelvis pierced by a supporting pile, showing that this burial was older than the reconstruction of the superincumbent dwelling-house. The urns contained the incinerated remains of bodies, charcoal, ashes, and an extraordinary wealth of grave-goods; but, unfortunately, the latter had been greatly damaged by the fire. It would appear, from the valuable nature of some of these offerings, that the cremated persons were of greater social distinction than those buried by inhumation. The objects consisted of fibulæ and spiral bracelets of bronze, beads of glass, amber, and enamel, and other ornamental relics characteristic of the Hallstatt period. Of special interest was one urn, which contained a necklet composed of several hundred beads of amber, enamel, and coloured glass, seven cowrie shells, two perforated teeth, and a large clay bead without any ornamentation. Among the relics which supply a clue to the latest date of the settlement were five coins, one of bronze and the others of potin—all 'barbarous imitations of the tetradrachms of Philip of Macedon' (356–336 B.C.).

A discovery which materially helped to define the chronological horizon of the pile-dwellings was the identification of the cemetery in which their inhabitants were buried. It was located on some ridges, not subject to submergence, at a distance of some 600 paces to the south-west of the *Pfahlbau*, and 200 from the present bed of the river. This necropolis contained both burnt and unburnt interments, and yielded an immense assortment of relics which, from the standpoint of archæology, were recognized to be precisely similar to those disinterred from the excavations in the 'Gradina.'

(*d*) *Pile-structures in Hungary.*—On the right bank of the Theiss, a few miles from the railway station of Szolnok, near the village of Tószeg, there is an artificial mound to which, since the meeting of the International Congress of Pre-historic Archæology at Budapest, in 1876, much importance has been attached, on account of the opinion expressed by L. Pigorini that it is identical in structure with the *terramara*-deposits of Northern Italy. The mound, though considerably undermined by the river Theiss during the great floods of 1876, is still of considerable extent, measuring 360 metres in length and 100 in breadth, and rising to a maximum height of 8 metres above the surrounding plain. It is only in times of flood that the waters reach the mound, its usual bed being a mile and a half distant. When the artificial nature of the mound became known in consequence of the section exposed by the floods, some extensive excavations were made to ascertain the archæological character of its contents. An assortment of the objects collected during these researches was exhibited at the Congress, among which were the following:

Perforated hammers of stag-horn, various pointed implements of bone and horn, perforated teeth and the leg-bone of a horse pierced in two places, probably a skate, polished stone celts (some perforated), four flint flakes (one of obsidian), corn grinders, and various worked stones; a fragment of a bronze pin, a bronze knife, and a small ingot of this metal; pottery, in the form of a variety of dishes, some with handles; various objects of burnt clay—a whistle, buttons, spoons, and eighteen pyramidal and perforated clay weights; a considerable amount of food-refuse, such as bones of animals, scales of fish, land shells, charred grain, etc.

During the meeting of the Congress, L. Pigorini, R. von Virchow, and Miss J. Mestorf visited the Tószeg excavations and made some further researches which enabled them to agree on the correctness of the following propositions, which were published in separate reports after their return home:

(1) The existence of piles and wooden beams was satisfactorily proved at three different levels; (2) the materials which contained the débris of human occupancy were distinctly stratified, and formed undulating layers amounting to a total thickness of 4 metres; (3) the antiquities collected belonged to the three pre-historic ages of Stone, Bronze, and Iron.

F. Romer gave an account of his excavations at Tószeg and other localities to the members of the Congress in an article entitled 'Les Terramares en Hongrie.' It is worthy of note that in one of the

stations, viz. Ascott-halom, he mentions that rotten piles were observed in its lowest stratum before Pigorini called attention to their significance. The author concludes his article by stating that *terramara* deposits are by no means confined to the valley of the Theiss, as they have already been observed in various other low-lying localities in the Danubian valley, both above and below Budapest. But the task of excavating such huge masses goes beyond the means at the disposal of ordinary archæological societies.[1]

7. General remarks.—Notwithstanding the discovery of various portions of human skeletons at several stations, and their subjection to the examination of anatomical experts, anthropologists are not agreed that the data thus ascertained prove that the constructors of the pre-historic pile-structures belonged to one race with definite physical characteristics. T. Studer (*ZE* xvii. [1885] 548) advocates the theory of Troyon, viz. that with the introduction of bronze there came a new race of people; and this opinion he bases on the fact that at Sutz and Vinelz two kinds of human skulls were found, viz. brachycephalic and dolichocephalic, whereas in the pure Stone Age stations only the former were, according to him, met with. Virchow's conclusions on lacustrine craniology are as follows (*ib.*, p. 300):

(1) In the stations of the pure Stone Age brachycephalic skulls only are known to a certainty to have existed. (2) In the transition period both brachycephalic and dolichocephalic skulls are known. (3) In the full Bronze Age there is a slight preponderance of dolichocephalic skulls.

On these grounds Virchow thought that during the Bronze Age a new people joined the original lake-dwellers by degrees, but not as conquerors subverting the previous order of things—an opinion which seems to be strengthened by the undoubted continuity of the same social organizations in both these periods. Bronze was gradually introduced, and it took some time to supersede the cutting implements previously in use. Nor was there any violent disturbance of the previous conditions of social life. The original system of constructing lake-villages was continued, and the only changes detected in their structure were such as can be accounted for by the use of better implements.

Although trepanning was practised in Central Europe as far back as the Stone Age, it does not appear that this custom was prevalent to a great extent among the lake-dwellers. Segments of the upper portions of human crania, supposed to have been used as drinking-cups, were found at Gerlafingen, Sutz, Schaffis, and Locras; and from the last-named there was also a skull having a circular portion cut out, as if *post mortem* trepanning had been performed. Roundlets cut out of skulls are supposed to have been used as charms, and such relics are frequently found in the graves of the period. From lake-dwellings only two of these objects have been recorded; one from Concise has two small perforations, and another, figured by Gross, has one hole. On the Trajan column a Dacian village is represented as having human skulls set on poles before the walls. The finding of skulls of different races in the lake-villages might, therefore, be accounted for on the supposition that they were trophies of their enemies, and not the skulls of their actual inhabitants.

In eastern Switzerland and the Danubian valley the number of settlements greatly decreased during the Bronze Age, while in the Lake of Geneva they increased, and in Lake Bourget its eight stations flourished almost exclusively in the Bronze period.

In instituting a comparison between the ordinary lake-dwellings and the *terremare* of Italy, it may be observed that the latter term was originally applied only to the fertilizing materials, and not, as at present, to the *tout ensemble* of a settlement. From this point of view any organic refuse from an inhabited site containing a sufficiently large amount of ammoniacal products to be used as fertilizers (as was the case with the contents of the Barma Grande cave at Mentone) might be not inappropriately so designated. If, on the other hand, the special features of Castellazzo—moat, dike, *contrafforte*, canals, roadways, citadel, ritual pits, trapezoidal shape—must be regarded as essential characteristics of *terramara* stations in general, then it must be admitted that there are few such structures outside Western Emilia. If, however, the few known examples of the Castellazzo type be excluded on the ground that they were military forts, we can find in the Po valley parallels to all the settlements which we have described elsewhere in Europe. In pile-structures on the sea-shore, and on marshy ground liable to flooding, dikes were indispensable. The Butmir station belonged to the Stone Age, and it did not appear that a dike was necessary either for defence against enemies or to prevent flooding, as it was constructed over water.

Much significance has been assigned to the pottery known as *ansa lunata* or *cornuta*. Formerly the manufacture of this handle was supposed to be a monopoly of the *terramara* folk of Emilia, but now it has been shown to have a wider distribution, extending southwards along the coast of the Adriatic as far as Taranto and other localities in S. Italy. It is found in the lake-dwellings of the eastern district of the Po valley, but—what is very remarkable—it is entirely absent from those of Piedmont and Western Lombardy. Outside Italy it is common in the early Iron stations of Bosnia, as at Ripać and Donja Dolina, as well as in Bohemia, Lower Austria, Hungary, Styria (*Bullettino di Palet. Ital.* xv. [1889] 65). Before the brachycephalic lake-dwellers swarmed into Europe, its neolithic inhabitants were dolichocephalic, and disposed of their dead by inhumation. It appears that they freely associated with the newcomers, as was the case with the Ihero-Liguri in N. Italy, where remains of the two civilizations were found on the same stations, that of the Stone Age being in the lower strata. There is evidence to show that burial by cremation was practised by the *terramara* folk, and by both the eastern and western lake-dwellers towards the end of the Bronze Age and beginning of the Iron Age; but whether the latter were cremationists on their first appearance in Italy is a problem that has not yet been solved. Singularly enough, the same uncertainty has been experienced with regard to the burial customs of the lake-dwellers of Central Europe. Some archæologists are inclined to exaggerate the importance of this question, on the plea that the manner of disposing of the dead is hereditarily so rooted in the human constitution that it would not be readily changed. But, as a matter of fact, the contrary is the case. Cremation, being the outcome of religious ideas, powerfully influenced humanity in those early days, and spread like wild-fire throughout the whole of Europe, so that the change from inhumation to incineration might have been accomplished in a short space of time.

The cause of the almost sudden discontinuance of the *palafitte* system of habitation all over Europe at the end of the Bronze Age is not known. We may, however, surmise that it was deeply-seated, and partly due to the law of the survival of the fittest, or rather the destruction of the unfittest. In the smaller lakes the growth of peat would make lacustrine habitations useless as a means

[1] For an elaborate and highly illustrated account of the *terremare* and analogous remains in Europe, readers may consult the present writer's recent book, *Palæolithic Man and Terramara Settlements in Europe*.

of defence. Of the settlements in the Po valley the lake-dwellings of Lake Garda were the last to be abandoned, but the *terremare* ceased to be occupied at an earlier period, apparently having been found inadequate to supply the social comforts prevalent among the races who subsequently dominated the Italian peninsula.

In conclusion, we are justified, from a consideration of the archæological phenomena hitherto disclosed by lacustrine research, in formulating the hypothesis that the primary founders of the lake-dwellings of Europe were brachycephalic immigrants, in the neolithic stage of culture, who, in successive hordes, moved westwards by way of the Danubian valley, but occasionally diverged from the main route into the numerous affluents of the Danube. The goal of all these shepherd farmers was the rich and well-watered pasture-lands along the lakes, brooks, and springs of the Alpine regions, which constitute the primary sources of the great rivers of Central Europe and their tributaries. The Scottish and Irish *crannogs*, the Glastonbury lake-village, and other lacustrine habitations of the Iron Age were but sporadic remnants of the more ancient system, which, like every dying art, passed through a stage of degeneration before final extinction.

LITERATURE.—For an exhaustive list of the literature on lake-dwellings up to 1890, see 'Bibliography of Lake-dwelling Researches in Europe' appended to R. Munro's *The Lake-Dwellings of Europe*, in which over 500 books, monographs, and special articles on the subject are chronologically arranged. We shall therefore here note only a few of the more general works on lake-dwellings, classifying them in chronological sequence: F. Keller, 'Die keltischen Pfahlhauten in den Schweizerseen,' *Mitt. der antiquar. Gesellsch. in Zürich*, ix. (1854), being the first report on the Swiss lake-dwellings (since then other 8 reports have appeared in the *Proceedings* of the same Society, the 9th by J. Heierli in 1888); W. R. Wilde, 'On Crannogs,' in *Descriptive Catalogue of the Antiquities in the Museum of the Royal Irish Academy*, Dublin, 1857; W. M. Wyllie, 'On Lake-Dwellings of the early Periods,' *Archæologia*, xxxviii. (1859); F. Troyon, *Habitations lacustres des temps anciens et modernes*, Lausanne, 1860; L. Rütimeyer, *Die Fauna der Pfahlbauten in der Schweiz*, Basel, 1861; J. Lubbock, 'On the Ancient Lake-Habitations in Switzerland,' *Nat. Hist. Review*, 1862, and *Prehistoric Times*, London, 1865, [7]1913; F. Keller, *The Lake-Dwellings of Switzerland and other Parts of Europe*, Eng. tr., J. E. Lee, London, 1866, [2]1878; E. Desor and L. Favre, *Le Bel Âge du bronze lacustre en Suisse*, Neuchâtel, 1874; R. Munro, *Ancient Scottish Lake-Dwellings or Crannogs*, Edinburgh, 1882; V. Gross, *Les Protohelvètes*, Paris, 1883; E. Vouga, *Les Helvètes à la Tène*, Neuchâtel, 1885; W. G. Wood-Martin, *The Lake-Dwellings of Ireland*, Dublin, 1886; R. Munro, *The Lake-Dwellings of Europe*, London, 1890; T. E. Peet, *The Stone and Bronze Ages in Italy and Sicily*, Oxford, 1909; R. Munro, *Palæolithic Man and Terramara Settlements in Europe*, Edinburgh, 1912. A monograph on the Glastonbury lake-village in two volumes is now being published by the Antiquarian Society of Glastonbury (1911–14).

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LALANGS.—See BODOS.

LĀMAISM.—The term 'Lāmaism' is now employed by many Europeans to designate the Buddhism of Tibet, and is intended to identify with that religion the Tibetan Buddhist monks, who are generally known as Lāmas, 'the superior ones.' It first appears to have been used by Köppen (and presumably coined by him) in his *Lamaische Hierarchie und Kirche*, 1859, which, as a pioneer work, gave some currency to the term, although it was employed by him only a few times and merely incidentally. It was not, however, adopted, though mentioned, by Emil Schlagintweit in 1863, who was the first authoritative systematic writer on the subject, setting aside the ponderous compilation by A. Giorgi of the 18th cent. (*Alphabetum Tibetanum*, Rome, 1762), which was little more than a literary curiosity. Altogether unknown to the Tibetans themselves, who designate their creed 'Buddha's religion' (*Sangs-rgyas-kyi ch'ös*) or 'the orthodox religion' (*nang-ch'ös*), this term is in many ways misleading, inappropriate, and undesirable. It conveys the implication that Tibetan Buddhism differs essentially from all other forms of that faith—which is not a fact, for its differences from mediæval Indian Buddhism are relatively trifling and mainly external.

The political ascendancy by which one sect of the Lāmas has achieved temporal power in modern times is in nowise an inherent part of the Buddhism professed by the Lāmas, nor is it shared by the older sects. It is not usual to designate religions by the generic name of their clergy; the epithet 'Brāhmanism' presents no real analogy, as that title is eponymic for the Supreme Creator in that faith, as well as descriptive of his ministers. Phonetically, also, the word is anomalous; for on the analogy of 'Buddhism' from Buddha, it should be 'Lāmism.' Altogether, therefore, 'Lāmaism' is an undesirable designation for the Buddhism of Tibet, and is rightly dropping out of use.

As the Buddhism of Tibet is intrinsically identical with, and derived from, Indian Buddhism of the Mahāyāna, the following account will indicate chiefly those features in which the Tibetan differs from the Indian Mahāyāna (*q.v.* for the general Buddhist doctrine and practices).

1. **Introduction of Buddhism into Tibet.**—The indigenous religion of Tibet was the Bon, a primitive animistic cult (see TIBET). According to all the vernacular histories, especially the most authoritative, the 'Chronicle of the Kings' (*Rgyal rabs*, and the somewhat apocryphal *Maṇi-bkah-hbum*), Buddhism was first introduced into Tibet in the reign of King Srong-btsan Gam-po, who died A.D. 650. But in the Lhāsa lithic edicts of 783, published by the present writer (*JRAS*, 1909, p. 931), the introduction of 'the orthodox religion,' *i.e.* Buddhism, is stated in general terms to have taken place several generations before Srong-btsan's epoch. This, however, may merely refer to the current legend that five generations before the advent of the latter, in the reign of a king named Lha Thotho-ri, certain Buddhist tracts and some relics fell from heaven upon the top of the king's palace, but that up till Srong-btsan's reign no one was able to decipher the writing. There seems to be no doubt that the indigenous histories are strictly correct in stating that before Srong-btsan's time Buddhism had not yet penetrated Tibet, and that that country was without a knowledge of the written character which is now called 'Tibetan,' which is merely a slightly modified form of the Indian alphabet as current in N. India (and in Khotan) in the middle of the 7th cent. A.D. It was certainly Srong-btsan who introduced this character, and along with it Buddhism in the form then most popular in India, the Mahāyāna.

The credit for the latter achievement is given in the *Maṇi-bkah-hbum* (the authorship of which is ascribed to Srong-btsan) to the two chief wives of the king, one the daughter of the king of Nepāl and the other an imperial Chinese princess. Though it is probable that these ladies may have contributed to the introduction of the new religion, as both of them certainly were Buddhists, it appears possible that Srong-btsan himself took the initiative, as he procured his Indian letters and early Buddhist texts from remote Kashmīr, and not from the more accessible Buddhist country of Nepāl, from which he would presumably have obtained them, had he been then married to his Nepālese wife; and his Chinese marriage was still later (in A.D. 641). The first booklet translated into Tibetan in the new letters was a hymn to Avalokita on the *Oṁ maṇi* formula—which formula, it is recorded, he engraved on stone. As the first patron of Buddhism in Tibet, Srong-btsan was canonized, as were also his wives, by the grateful monks in later days.

But Srong-btsan was not the saintly person he is pictured in the religious histories, for he is seen in the contemporary Chinese chronicles to have been engaged all his life in bloody wars (see his invasion of Central India in A.D. 647 as described by the present writer in *Asiatic Quart. Rev.*, vol. xxxii.